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Vol. 42, No. 17, pp. 435-442, 21 figs.

October 26, 1981

STUDIES ON THE NEBRIINI (COLEOPTERA: CARABIDAE),
IV. FOUR NEW *NEBRIA* TAXA FROM
WESTERN NORTH AMERICA

By

David H. Kavanaugh

Department of Entomology, California Academy of Sciences,
Golden Gate Park, San Francisco, California 94118

ABSTRACT: This paper, fourth of a series on the nebrini carabid beetles, provides names for four undescribed taxa from western North America, including: *Nebria danmanni* (type-locality: Deception Basin, Olympic National Park, Washington), *N. sonorae* (Chipmunk Flat, Tuolumne County, California), *N. turmaduodecima* (Caribou Basin, Siskiyou County, California), and *N. meanyi giulianii* (Milner Creek, Mono County, California). Diagnostic combination of characters and comment on geographical distribution are provided for each new taxon and distinguishing features are illustrated.

INTRODUCTION

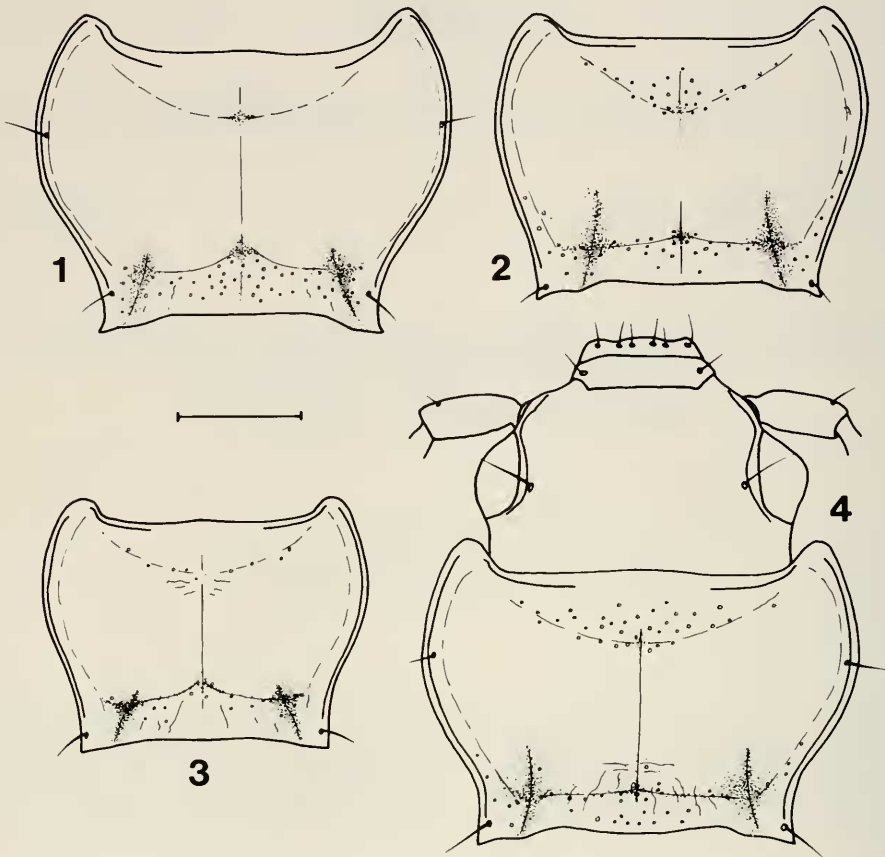
As part of an ongoing project on the Nebrini of the world, Kavanaugh (1979) provided names for 5 new species and 23 new subspecies of genus *Nebria* Latreille from North America and updated nomenclature for Nearctic members of the genus. Since the appearance of that paper, three new species and one new subspecies of *Nebria* have been discovered.

The purpose of this report, an addendum to Kavanaugh (1979), is to provide names for these new taxa. Names are needed immediately for use in several other manuscripts and by other workers. To this end, data and discussion presented for each name are limited to little more than the minimum required by the International Code of Zoological Nomenclature for availability. Additional information on all Nearctic *Nebria* taxa, including those presented here as new, will be presented in a subsequent paper now in preparation.

MATERIALS

This study is based on examination of 187 adult *Nebria* specimens. Following is a list of abbreviations used in the text which refer to the collections from which specimens were received and/or in which paratype specimens have been deposited. Names of curators who sent specimens are also included.

- CAS—California Academy of Sciences, San Francisco, California 94118; D. H. Kavanaugh.
CDA—California State Department of Food and Agriculture, Sacramento, California 95814; F. G. Andrews.
DMan—D. Mann, University of Washington, Seattle, Washington 98195.
UASM—University of Alberta, Strickland Museum, Edmonton, Alberta T6G 2E3; G. E. Ball.
UCD—University of California, Davis, California 95616; R. O. Schuster.
USNM—United States National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560; T. L. Erwin.



FIGURES 1-4. Figs. 1-3. Pronotum, dorsal aspect; scale line = 1.0 mm. 1. *Nebria turmaduodecima* n.sp. (Upper Caribou Lake, California). 2. *Nebria danmanni* n.sp. (Deception Basin, Washington). 3. *Nebria sonorae* n.sp. (Chipmunk Flat, California). Fig. 4. Head and pronotum, dorsal aspect, *Nebria meanyi giulianii* n.sp. (Milner Creek, California).

METHODS

Methods which relate specifically to data and results presented in this paper (including dissection techniques and criteria for ranking taxa) are described in Kavanaugh (1979). A broader and more detailed discussion of preparative and procedural methods used will be included in a subsequent paper (Kavanaugh, manuscript in preparation).

NEW *NEBRIA* TAXA

The order of presentation of new taxa follows a new classification of Nearctic *Nebria* to be presented at a later date (Kavanaugh, manuscript in preparation).

Nebria turmaduodecima, new species

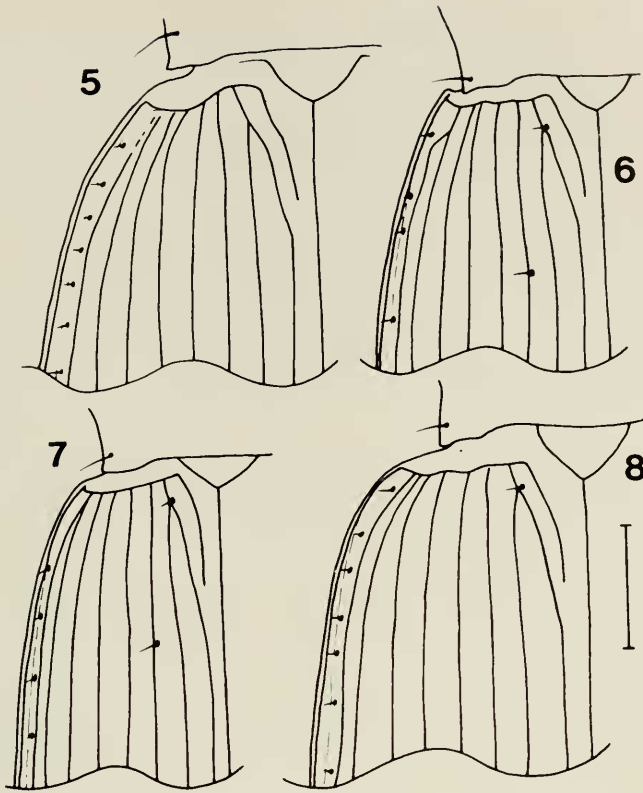
(Figures 1, 5, 9, 13, 17, 21)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., California, Siskiyou Co., Trinity Alps, Caribou Basin (south rim), at

snowfield edges, 2290m, 12 Aug. 1980, Stop #80-27 D. H. Kavanaugh collector"/"D. H. Kavanaugh Collection" [orange label]/"Holotype *Nebria turmaduodecima* Kavanaugh det. D. H. Kavanaugh 1981" [red label]/"California Academy of Sciences Type No. 13729." PARATYPES: 140 (65 males, 75 females), deposited in CAS, CDA, UASM, UCD, USNM.

TYPE-LOCALITY.—Caribou Basin, 2290 m, Trinity Alps, Siskiyou County, California.

DIAGNOSTIC COMBINATION.—Size medium, standardized body length of male less than 12.0 mm, of female less than 12.4 mm; head dark, with pair of pale spots present on vertex (partially fused medially in some individuals); elytra slightly shiny (microsculpture moderately impressed, meshes isodiametric or very slightly transverse), without metallic reflection (very slightly developed in a few individuals only); pronotum (Fig. 1) with midlateral and basolateral setae present; elytral silhouette markedly ovoid, narrowed basally (Fig. 5); hindwing (Fig. 9) vestigial; median lobe of male genitalia as in



FIGURES 5–8. Basal region of left elytron, dorsal aspect; scale line = 1.0 mm. 5. *Nebria turmaduolecima* n.sp. (Upper Caribou Lake, California). 6. *Nebria danmanni* n.sp. (Deception Basin, Washington). 7. *Nebria sonorae* n.sp. (Chipmunk Flat, California). 8. *Nebria meanyi giulianii* n.ssp. (Milner Creek, California).

Figure 13; bursa copulatrix of female as in Figure 17; specimen from Trinity Alps, northwestern California.

DERIVATION OF TAXON NAME.—The species epithet is a combination of the Latin words for “troop” (= *turma*) and “twelve” (= *duodecima*). It is a pleasure for me to name this species in honor of the boys of Troop 12, Boy Scouts of America, Petaluma, California, who assisted me in collecting the first known specimens of this species.

GEOGRAPHICAL DISTRIBUTION.—Figure 21. Known only from Caribou Basin in the Trinity Alps of northwestern California; range probably restricted to the Trinity Alps. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Siskiyou County, Caribou Basin (south rim [2290 m]) [Aug.] (45; CAS), Upper Caribou Lake (east shore [2100–2130 m]) [Aug.] (96; CAS, CDA, UASM, UCD, USNM).

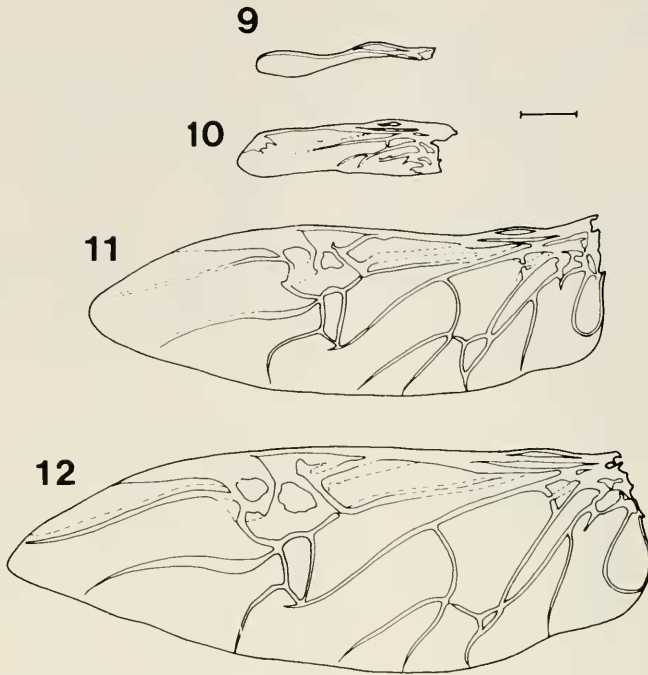
***Nebria danmanni*, new species**

(Figures 2, 6, 10, 14, 18, 21)

HOLOTYPE, a male, in CAS, labelled: “U.S.A., Washington, Olympic National Park, Deception Basin, 6000 ft., 4 Sept. 1976 D. Mann collector”/“Holotype *Nebria danmanni* Kavanaugh det. D. H. Kavanaugh 1981” [red label]/“California Academy of Sciences Type No. 13730.” **PARATYPES**: 28 (13 males, 15 females), deposited in CAS, DMan, UASM, USNM.

TYPE-LOCALITY.—Deception Basin, 1830 m, Olympic National Park, Washington.

DIAGNOSTIC COMBINATION.—Dorsal surface very shiny, elytral microsculpture formed of markedly transverse meshes; pronotum (Fig. 2) with apical angle markedly projected anteriorly, basal angle rectangular, denticulate, and moderately projected posteriorly, basal situation of lateral margin very long and shallow, midlateral seta absent; elytral silhouette subrectangular, markedly elongate, slightly narrowed basally, humeral angle (Fig. 6) markedly distinct, humeral carina markedly developed and projected



FIGURES 9–12. Left hindwing; scale line = 1.0 mm. 9. *Nebria turmaduodecima* n.sp. (Upper Caribou Lake, California). 10. *Nebria danmanni* n.sp. (Deception Basin, Washington). 11. *Nebria sonora* n.sp. (Chipmunk Flat, California). 12. *Nebria meani giulianii* n.sp. (Milner Creek, California).

anteriorly; hindwing (Fig. 10) markedly shortened and narrowed; middle tibia moderately concave to slightly sulcate dorsally at middle, brush of dorsal setae moderately dense subapically; hindcoxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; median lobe of male genitalia as in Figure 14; bursa copulatrix of female as in Figure 18.

DERIVATION OF TAXON NAME.—I take great pleasure in naming this species in honor of my friend and field companion, Daniel H. Mann, who collected the first known specimens, including the holotype, of this species.

GEOGRAPHICAL DISTRIBUTION.—Figure 21. Known only from Deception Basin in southeastern Olympic National Park, Washington; range probably restricted to the Olympic Mountains at high elevations. I have studied specimens from the following localities.

United States of America

WASHINGTON: Olympic National Park, Deception Basin ([1830 m]) [Sep.] (11; CAS, DMan), Mount Mystery (east slope [1800–1860 m]) [July] (18; CAS, USNM).

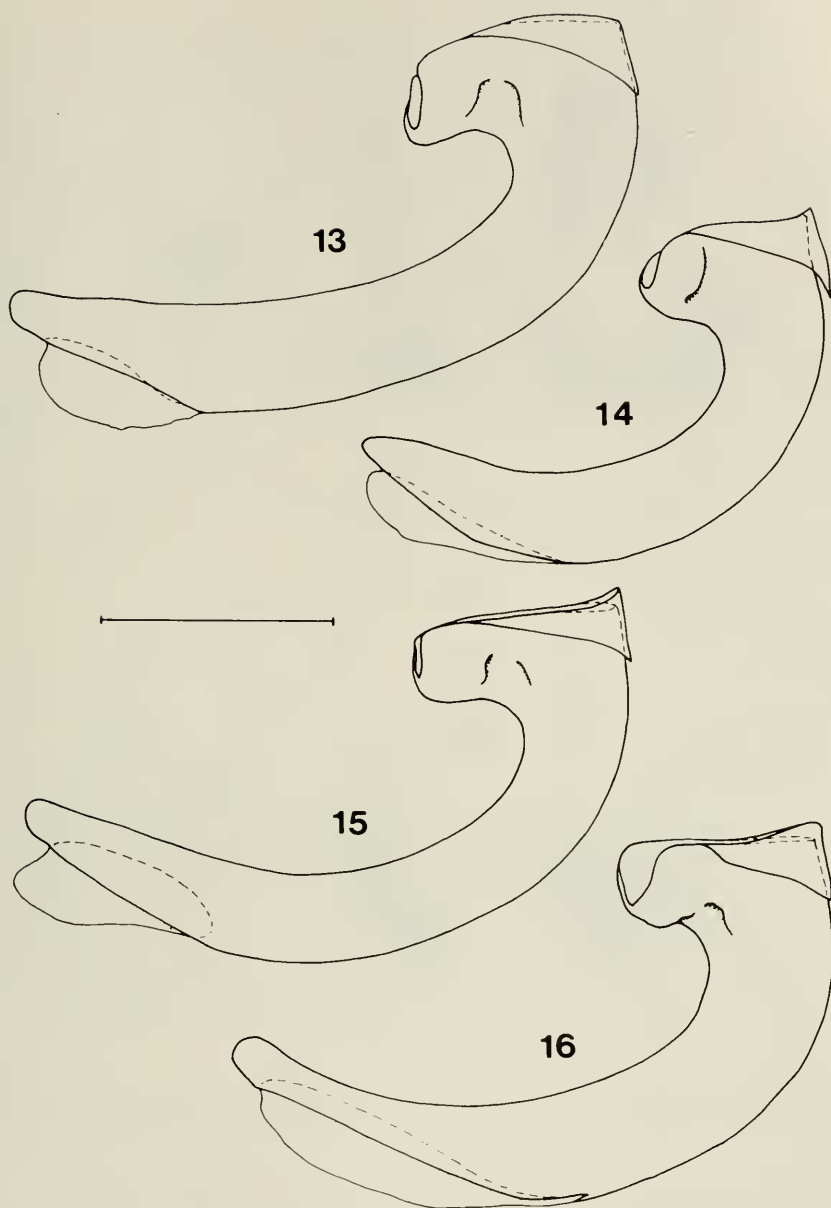
***Nebria sonora*, new species**

(Figures 3, 7, 11, 15, 19, 21)

HOLOTYPE, a male, in CAS (on indefinite loan deposit from UCD) labelled: "Chipmunk Flat Tuolumne Co., Calif. VIII-9-60"/"R. R. Montanucci Collector"/"Holotype *Nebria sonora* Kavanaugh det. D. H. Kavanaugh 1981" [red label]/"California Academy of Sciences Type No. 13731." **PARATYPES**: two females, deposited in CAS, UCD.

TYPE-LOCALITY.—Chipmunk Flat, Tuolumne County, California.

DIAGNOSTIC COMBINATION.—Dorsal surface moderately shiny, elytral microsculpture moderately impressed, formed of isodiametric (or nearly so) meshes; pronotum (Fig. 3) with apical angle moderately projected, basal angle rectangular or slightly acute, not projected posteriorly, basal sinuation of lateral margin moderate in length and depth, midlateral seta absent; elytral silhouette subrectangular, moderately elongate, moderately narrowed basally, humeral angle (Fig. 7) moderately distinct, humeral carina well developed and projected anteriorly; hindwing (Fig. 11) full-sized and width; middle tibia moderately sulcate dorsally at middle, brush of dorsal setae moderately dense subapically; hind



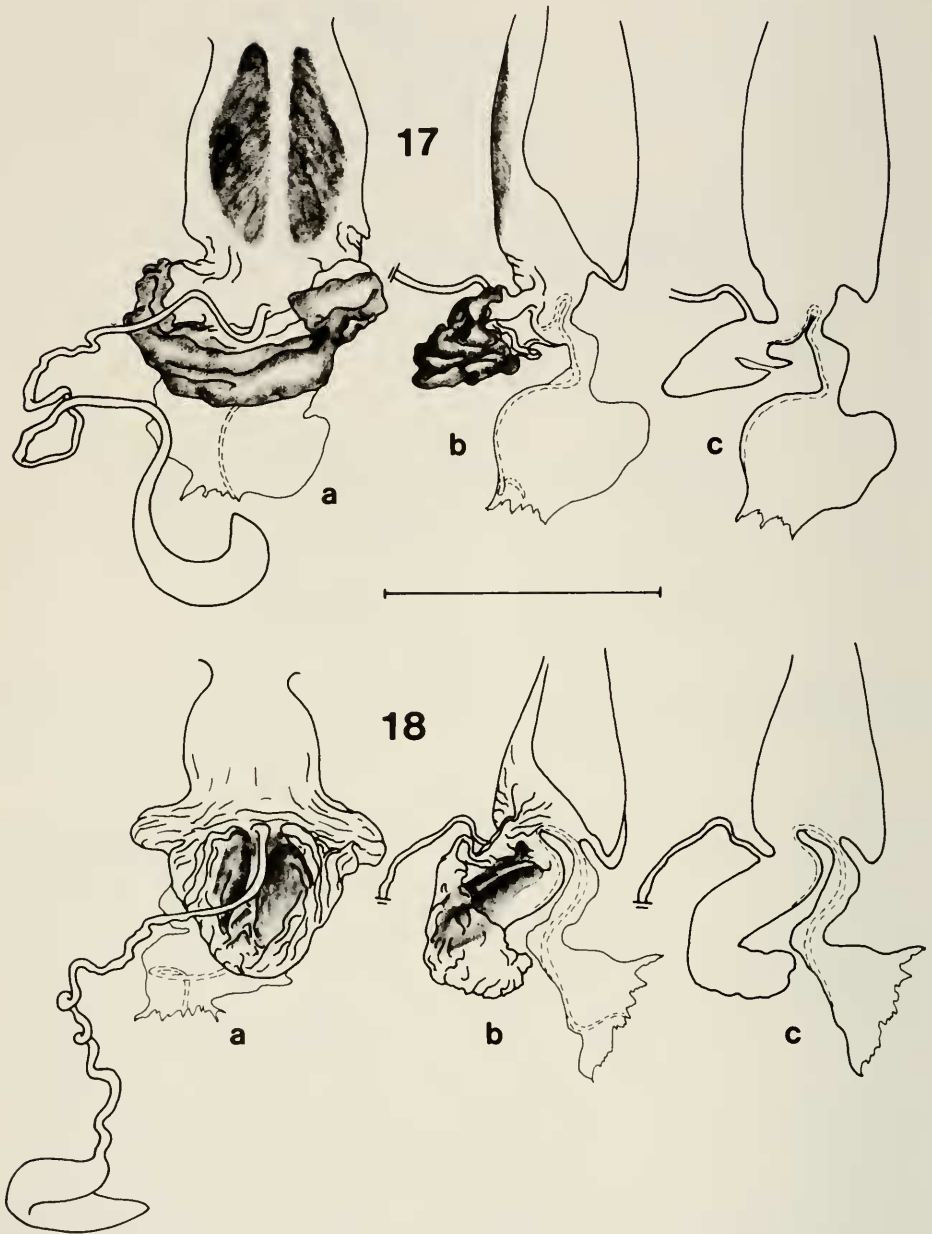
FIGURES 13-16. Median lobe of male genitalia, left lateral aspect; scale line = 1.0 mm. 13. *Nebria turmaduodecima* n.sp. (Upper Caribou Lake, California). 14. *Nebria danmanni* n.sp. (Deception Basin, Washington). 15. *Nebria sonorae* n.sp. (Chipmunk Flat, California). 16. *Nebria meanxi giulianii* n.ssp. (Montgomery Creek, California).

coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; median lobe of male genitalia as in Figure 15; bursa copulatrix of female as in Figure 19.

DERIVATION OF TAXON NAME.—This species

is named for Sonora Pass, which is the low point on the main divide of the Sierra Nevada between Tuolumne and Mono counties and is the dominant landmark in the vicinity of the type-locality.

GEOGRAPHICAL DISTRIBUTION.—Figure 21.

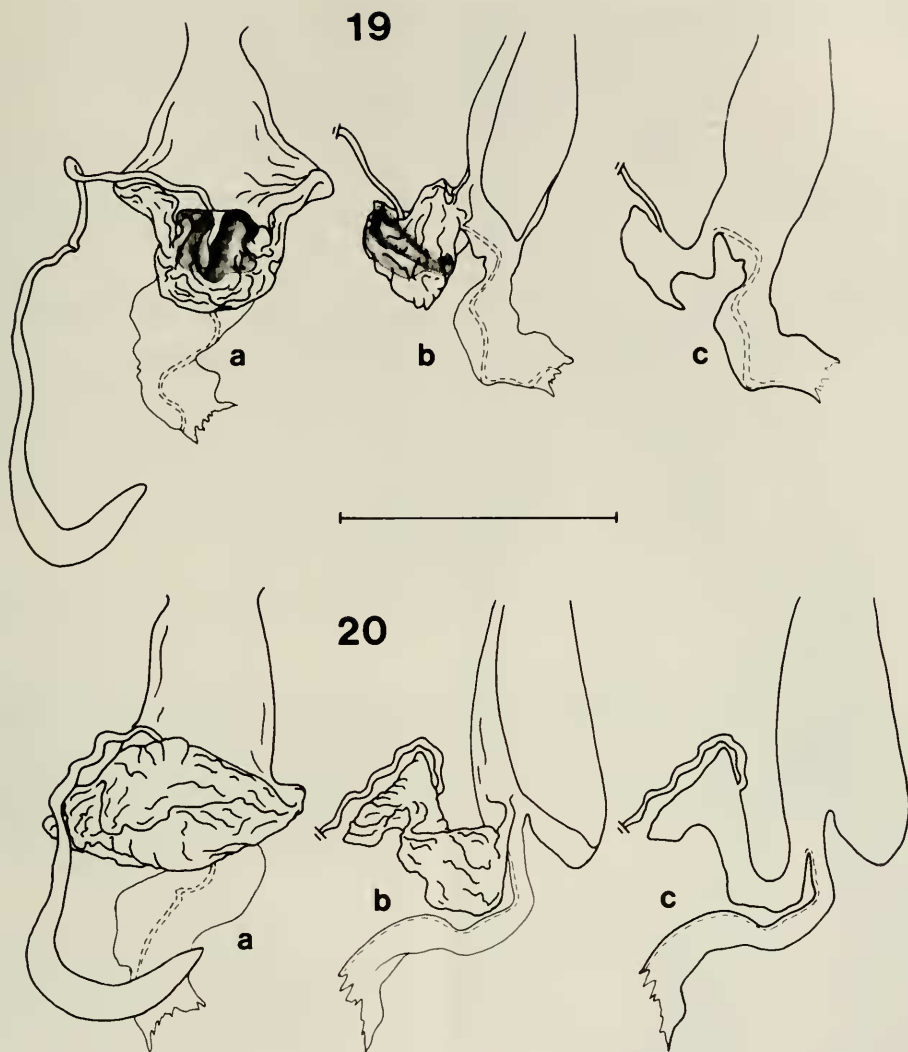


FIGURES 17-18. Bursa copulatrix (a, dorsal aspect; b, left lateral aspect; c, mid-sagittal outline, left lateral aspect); scale line = 1.0 mm. 17. *Nebria turmaduodecima* n.sp. (Upper Caribou Lake, California). 18. *Nebria danmanni* n.sp. (Deception Basin, Washington).

Known only from Chipmunk Flat, Tuolumne County, California, and the stream (southeast of and above the Flat) which drains the northwest flank of Leavitt Peak massif; range probably restricted to that portion of the Sierra Nevada be-

tween Sonora Pass and Buckeye Pass. I have studied specimens from the following localities.
United States of America

CALIFORNIA: Tuolumne County, Chipmunk Flat (and stream SE [2440-2680 m]) [June, Aug.] (3; CAS, UCD).



FIGURES 19–20. Bursa copulatrix (a, dorsal aspect; b, left lateral aspect; c, mid-sagittal outline, left lateral aspect); scale line = 1.0 mm. 19. *Nebria sonorae* n.sp. (Chipmunk Flat, California). 20. *Nebria meanyi giulianii* n.ssp. (Milner Creek, California).

Nebria meanyi giulianii, new subspecies

(Figures 4, 8, 12, 16, 20, 21)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., California, Mono County, White Mts., Montgomery Creek, 2380m, 21 June 1980 D. Giuliani collector"/"Holotype *Nebria meanyi giulianii* Kavanaugh det. D. H. Kavanaugh 1981" [red label]/"California Academy of Sciences Type No. 13732." PARATYPES: 13 (3 males, 10 females), deposited in CAS.

TYPE-LOCALITY.—Montgomery Creek, 2380 m, Mono County, California.

DIAGNOSTIC COMBINATION.—Size medium, standardized body length of male less than 12.0

mm, of female less than 12.3 mm; head dark, with pair of pale spots present on vertex; elytra with slight to moderate metallic blue, green, or violet reflection; head (Fig. 4) relatively broad, antennal scape short, cylindrical; pronotum (Fig. 4) relatively short, wide, moderately cordate, slightly broad basally, hind angle rectangular, moderately projected posteriorly, mid-lateral seta present; elytral silhouette subrectangular, broad basally, basal margination (Fig. 8) moderately concave; hindwing (Fig. 12) full-

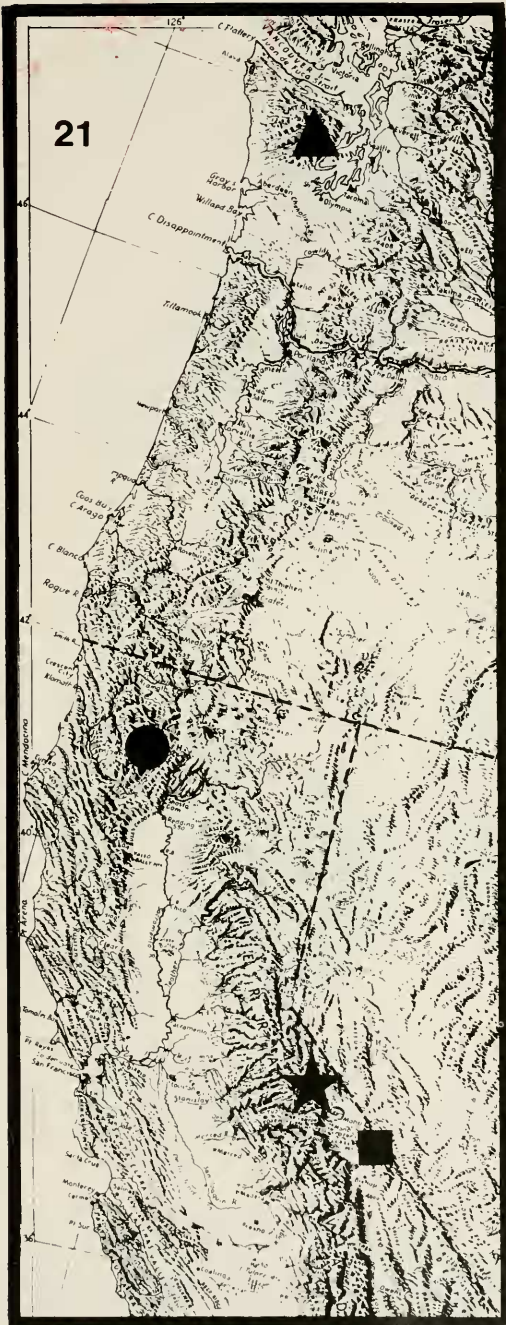


FIGURE 21 Map of geographical distributions: *Nebria turmaduodecima* n.sp. = solid circle; *Nebria danmanni* n.sp. = solid triangle; *Nebria sonorae* n.sp. = solid star; *Nebria meani giulianii* n.ssp. = solid square.

sized; median lobe of male genitalia as in Figure 16; bursa copulatrix of female as in Figure 20; specimen from White Mountains of eastern California (Fig. 21).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this subspecies in honor of Derham Giuliani, a naturalist and friend whose long-term interest has been the exploration and biotic inventory of remote and poorly sampled parts of California and Nevada. On one of his recent forays, he discovered populations of this new subspecies.

GEOGRAPHICAL DISTRIBUTION.—Figure 21. Known only from two localities on the western slope of the White Mountains of eastern California; range probably restricted to that mountain chain. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Mono County, Milner Creek ([2440 m]) [July] (9; CAS), Montgomery Creek ([2380 m]) [June] (5; CAS).

ACKNOWLEDGMENTS

In addition to those individuals whose contributions I acknowledged in naming three of the taxa described above, I thank Terry L. Erwin and my son, Thomas W. Kavanaugh, for their help and companionship during field work in the Olympic Mountains (Washington) and Sonora Pass area (California), respectively.

LITERATURE CITED

KAVANAUGH, D. H. 1979. Studies on the Nebriini (Coleoptera: Carabidae). III. New Nearctic *Nebria* species and subspecies, nomenclatural notes, and lectotype designations. Proc. Calif. Acad. Sci. 42:87-133.